

**Amendments to the Drawings:**

The attached one (1) sheet of drawings include changes to Figure 9. This sheet, which includes Figure 9, replaces the original sheet including Figure 9.

Attachment: Replacement Sheet  
Annotated Sheet Showing Changes

### REMARKS/ARGUMENTS

In view of the foregoing amendments and the following remarks, the applicants respectfully submit that the pending claims are not rendered obvious under 35 U.S.C. § 103. Accordingly, it is believed that this application is in condition for allowance. **If, however, the Examiner believes that there are any unresolved issues, or believes that some or all of the claims are not in condition for allowance, the applicants respectfully request that the Examiner contact the undersigned to schedule a telephone Examiner Interview before any further actions on the merits.**

The applicants will now address each of the issues raised in the outstanding Office Action.

#### Objections

The title was objected to as not being descriptive. The title has been amended to be more indicative of the invention to which the claims are directed.

#### Rejections under 35 U.S.C. § 103

Claims 1, 2, 4, 6, 9, 10 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent Publication No. 08-079633 ("the Kondo publication") in view of U.S. Patent No. 5,920,144, ("the Atsuta patent"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

### **Claims 1 and 2**

In the photographing device according to claim 1, the optical element is provided between the photographing optical system and the photoelectric conversion element in such a way as to seal the photoelectric conversion element, thereby preventing dust from adhering to the photoelectric element itself.

At a peripheral portion of the optical element, a piezoelectric element is provided, and the optical element is resonantly vibrated by vibration of the piezoelectric element, thereby removing dust adhering to the surface of the optical element. In this case, frequencies close to two or more resonance frequencies which are different in order are successively applied, and the optical element is vibrated at the successively applied frequencies (for example, it might be subjected to a low-order resonance vibration, and then to a high-order resonance vibration), thereby more effectively removing dust than in the case where the optical element is vibrated at a single resonance frequency.

On the other hand, the Kondo publication discloses a photographing device in which a CCD line sensor 36 is fitted to a pedestal 52. The pedestal 52 is hammered by a piezo element 60 causing it (and therefore the CCD line sensor 36) to vibrate for purposes of removing dust adhering to the CCD line sensor 36. In the Kondo publication, the vibration frequency and the amplitude are varied within a predetermined range. However, the entire photographing unit is **not resonantly vibrated**. Rather, its is simply hammered. In addition, the Kondo publication is entirely different from claim 1 of the

present application in the object to be vibrated and structure.

The Atsuta patent describes a control method which uses two resonance frequencies for purposes of driving an oscillating-wave motor. That is, it is not particularly relevant to the photographing device according to claim 1 of the present application (nor is it particularly relevant to the device in the Kondo publication). This is because in principle, the oscillating-wave motor adds resonance vibration by an A-phase piezoelectric element and that by a B-phase piezoelectric element to cause a vibration member to generate a single resonance vibration, as a result of which it obtains a driving force as an actuator.

Therefore, in the Atsuta patent, it is necessary to apply an alternating voltage to the two piezoelectric elements **at the same time**. In addition, their resonance vibration has the same order. In other words, the Atsuta patent does not disclose that an optical element is vibrated **at a plurality of frequencies in turn, which are close to two or more resonance frequencies different in order from each other**, as recited in claim 1 as a feature of the photographing device thereof. The principle of the oscillating-wave motor in the Atsuta patent does not even suggest the above feature of the photographing device of claim 1.

As can be appreciated from the foregoing, neither the Kondo publication, nor the Atsuta patent, nor their combination, teach **an optical element**, arranged between the photographing optical system and the photoelectric conversion element in such a manner as to seal the photoelectric conversion element, caused to be **vibrated**

**at a plurality of frequencies close to two or more resonance frequencies different in order from each other in turn.** Accordingly, claim 1 is not rendered obvious by the Kondo publication and the Atsuta patent for at least this reason. Since claim 2 depends from claim 1, it is similarly not rendered obvious. Since claim 7 depends from claim 2, it is similarly not rendered obvious.

**Claims 4 and 6**

In the photographing device recited in claim 4, after being subjected to a low-order resonance vibration, the optical element is subjected to a high-order resonance vibration (that is, the order of the resonance vibration is varied from high order to low order). This removes dust more effectively than if the optical element is vibrated at a single resonance frequency.

As was the case with claim 1, the Kondo publication differs from claim 4, in both the object to be vibrated and the structure. The Atsuta patent is not relevant to the photographing device of claim 4 for the same reason as in claim 1. Further, note that the Atsuta patent does not disclose the feature "first outputs a control signal for causing the optical element to undergo a low-order resonance vibration and then a control signal for causing the optical element to undergo a high-order resonance vibration" in claim 4. The principle of the oscillating-wave motor in the Atsuta patent does not even suggest the above feature of claim 4.

Therefore, neither Kondo publication, nor the Atsuta patent, nor their combination, include the features of the photographing device recited in claim 4. Accordingly, claim 4 is not rendered obvious by the Kondo

publication and the Atsuta patent for at least the foregoing reasons. Since claim 6 depends from claim 4, it is similarly not rendered obvious. Further regarding claim 6, as discussed above, the Atsuta patent does not disclose primary vibration having a single node or secondary vibration having two nodes. Thus, claim 6 is further distinguished over the Kondo publication and the Atsuta patent.

#### **Claims 9 and 10**

The photographing device recited in claim 9 causes the optical element to generate standing-wave vibration, and controls the frequency of the periodic drive signal to cause the nodes of the standing-wave vibration to be successively shifted, thereby more effectively removing dust than in the case where the optical element is caused to generate a single stand-wave.

As was the case with claim 1, the Kondo publication is entirely different from claim 9, both in the object to be vibrated and structure. The Atsuta patent is not particularly relevant to the photographing device of claim 9 for the same reason as in claim 1. Note that the Atsuta patent does not teach elements which "causes the optical element to generate standing-wave vibration" and "controls a frequency of the periodic drive signal to cause the nodes of the standing-wave vibration to be successively shifted" in the photographing device of claim 9. The principle of the oscillating-wave motor in the Atsuta patent does not even suggest the above features of claim 9.

Therefore, neither Kondo publication, nor the Atsuta patent, nor their combination, include the features of

the photographing device recited in claim 9. Accordingly, claim 9 is not rendered obvious by the Kondo publication and the Atsuta patent for at least the foregoing reasons. Since claim 10 depends from claim 9, it is similarly not rendered obvious. Further regarding claim 10, the Atsuta patent does not disclose that the frequency of the drive signal is controlled such that the nodes of the standing-wave vibration are shifted at predetermined intervals. Thus, claim 10 is further distinguished over the Kondo publication and the Atsuta patent.

#### **Amendments to the Specification and Drawings**

The specification and drawings have been amended to correct a number of minor errors.

#### **Conclusion**

In view of the foregoing amendments and remarks, the applicants respectfully submit that the pending claims are in condition for allowance. Accordingly, the applicants request that the Examiner pass this application to issue.

Any arguments made in this amendment pertain **only** to the specific aspects of the invention **claimed**. Any claim amendments or cancellations, and any arguments, are made **without prejudice to, or disclaimer of**, the applicants' right to seek patent protection of any unclaimed (e.g., narrower, broader, different) subject matter, such as by

way of a continuation or divisional patent application  
for example.

Respectfully submitted,

November 13, 2007



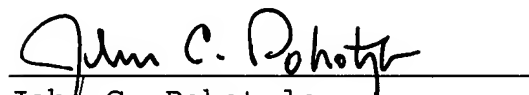
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**CERTIFICATE OF MAILING under 37 C.F.R. 1.8(a)**

I hereby certify that this correspondence is being deposited on **November 13, 2007** with the United States Postal Service as first class mail, with sufficient postage, in an envelope addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.



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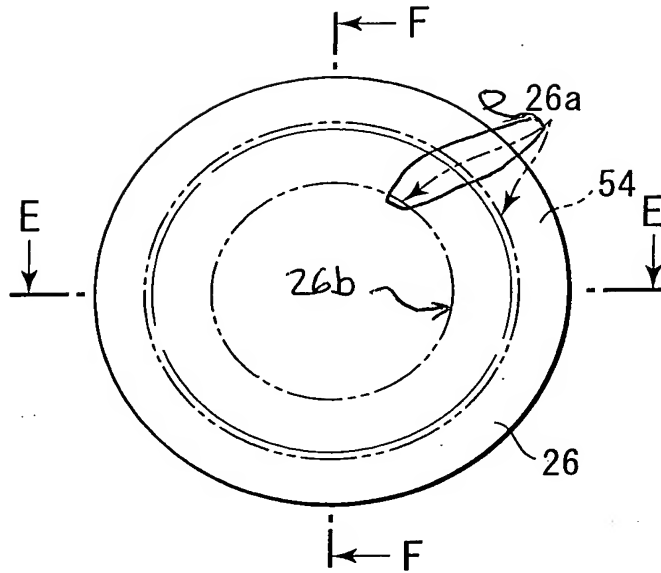


FIG. 9

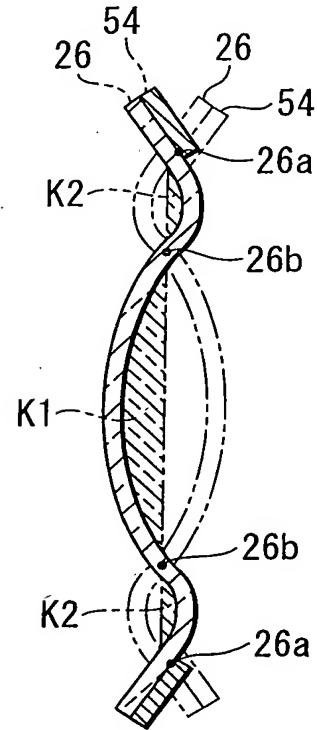


FIG. 11

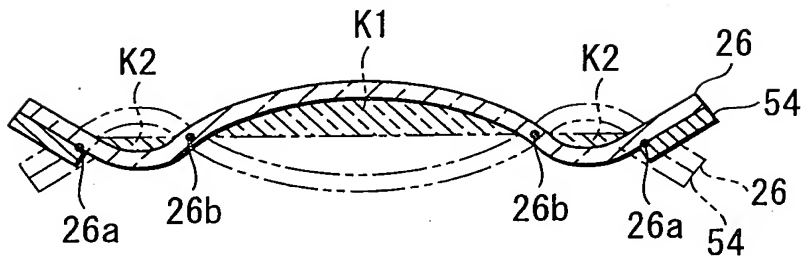


FIG. 10